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44. (Amended) A substrate comprising a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium, and yttrium; (2) M, O, H, and N wherein M is defined above; and (3) O, C, H, a and N and wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group.

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45. (Amended) A substrate comprising a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium, and yttrium; (2) M, O, H, and N wherein M is defined above; (3) O, C, H, a and N; and (4) M or C, and one of O, H, or N; and wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group.

46. (Amended) A substrate comprising a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising Si, C, and H deposited in a PECVD process with a tetra methyl silane ( $\text{Si}(\text{CH}_3)_4$ ) precursor and wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group.

47. (Amended) A substrate comprising a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon,

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titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium;  
(2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M  
or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated  
with the at least one electrophilic or nucleophilic functional group and wherein the at  
least one electrophilic or nucleophilic functional group is deposited by a plasma  
treatment.

48. (Amended) A substrate comprising a surface with at least one  
electrophilic or nucleophilic functional group attached thereto, said substrate having a  
coating positioned thereon, the coating comprising an amorphous chemically  
crosslinked material comprising elements selected from the group consisting of (1) M,  
O, C, H, and N; wherein M is a metal selected from the group consisting of silicon,  
titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium;  
(2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M  
or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated  
with the at least one electrophilic functional group for electrostatically attracting  
positively charged molecules for adsorption and electrostatically repelling negatively  
charged molecules for non-adsorption.

49. (Amended) A substrate comprising a surface with at least one  
electrophilic or nucleophilic functional group attached thereto, said substrate having a  
coating positioned thereon, the coating comprising an amorphous chemically  
crosslinked material comprising elements selected from the group consisting of (1) M,  
O, C, H, and N; wherein M is a metal selected from the group consisting of silicon,  
titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium;  
(2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M  
or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated  
with the at least one nucleophilic functional group for electrostatically attracting  
negatively charged molecules for adsorption and electrostatically repelling positively  
charged molecules for nonadsorption.

50. (Amended) A substrate comprising a surface with at least one  
electrophilic or nucleophilic functional group attached thereto, said substrate having a

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coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one nucleophilic functional group.

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